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Coal Tar/Creosote

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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EPA

Pesticide Fact Sheet

Name of Chemical: COAL TAR/CREOSOTE
Reason for Issuance: REGISTRATION STANDARD
Date Issued: APRIL 1988
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1. DESCRIPTION OF CHEMICALS

Chemical names: Creosote is a complex, heterogeneous mixture of chemicals derived from the fractional distillation of coal or wood tar. Most coal tar/creosote formulations for wood preservation should conform to the eight standards of the American Wood Preservers Association's(AWPA). The standards consist of physical properties and percentages of specified distillation ranges.

Common names: Coal tar/creosote

Pesticide type: Wood preservative, fungicide, bacteriocide, insect repellent for wood boring insect

Chemical family: Organic compounds

Major U.S. Producers: Koppers, Aristech Chemical, Allied Chemical, Reilly Tar and Chemical Company

2. USE PATTERN AND FORMULATIONS

Application Sites: Wood and wood products, such as

- °Pressure treated wood for construction
- °Groundline treat of utility poles
- °Home and farm use
- °Pole framing
- °Pilings
- °Railroad tie repair

Types of Formulations: End use products vary from liquid to viscous semi-solid tars and pitches

Method of Application: Pressure treatment and non-pressure treatments; brush-on, spray-on and dipping (soaking)

3. SCIENCE FINDINGS

Chemical characteristics

Physical state - viscous to oily liquid
Color - Black to yellowish-green
Odor - Naphthalene-like (petroleum)
Boiling point - Variable
Specific gravity - 1.08 and above at 20°C
Solubility - Soluble in organic solvents, e.g., benzene, ether, alcohol, acetone; slightly soluble in water

Toxicological Characteristics:

Acute toxicty - Because of the complex nature of coal tar/creosote and its constituents, acute toxicity of differing formulations may vary considerably. Eye and skin burns, conjunctivitis and skin sensitization have been reported in conjunction with worker exposures.

Oral - Moderately toxic

Dermal - Moderately toxic

Inhalation - Undetermined

Eye Irritation - Corrosive or highly irritating to eyes

Skin Irritation - Undetermined

Dermal Sensitization - Undetermined

Oncogenicity: On a qualitative basis, there is substantial evidence of oncogenicity associated with coal tar/creosote products. There are no epidemiological studies of workers using coal tar/creosote products in wood treatment plants. However, epidemiological studies of coke oven workers, who are exposed to coal tar compounds from coke oven emissions, reveal increased incidences of lung, bladder, prostate, pancreas, and intestinal cancer. Coal tar and many of its constituents have been well characterized as oncogens in animal studies. However, because of the complexity of coal tar/creosotes, available studies are not adequate for quantitative risk assessment. An epidemiological study would provide the best basis for assessing the human oncogenic risk of coal tar/creosote.

The Agency is requiring oncogenicity studies in mice by the dermal route, and is requiring that a preliminary epidemiological study be conducted to collect data to be used in designing a comprehensive epidemiological study.

In addition, the Agency is requiring exposure studies among treatment plant workers exposed to coal tar/creosote. These studies, together with mouse dermal oncogenicity studies, will permit the Agency to conduct a quantitative risk assessment.

Mutagenicity: Coal tar/creosote formulations have been shown to elicit mutagenic responses in laboratory test species including microbial and mammalian test systems. Creosote showed a positive response in the Ames Test for mutagenicity. The Agency is requiring additional mutagenicity studies.

Teratogenicity: Data are not available to assess the teratogenic or fetotoxic effects of coal tar/creosote products. These data are required.

Environmental characteristics: Data are not available on the environmental fate characteristics of coal tar/creosote or its individual constituents. These data are required. Testing procedures and test materials will be selected based on evaluation of product chemistry and other required data.

Ecological Characteristics: The Agency has very limited data regarding availability and toxicity of coal tar/creosote constituents to fish and wildlife species.

Laboratory bioassays indicate the coal tar products are generally moderately toxic to aquatic organisms. Because the amount and type of exposure in the field is unknown, it is not possible to estimate risks to aquatic organisms. Other than laboratory data, there is no evidence to date of environmental hazards to marine organisms (including endangered species) from its use in treating wood used in aquatic sites.

Aquatic toxicity studies are required, and if significant toxicity is found, studies will be required using treated wood to simulate actual environmental exposures to freshwater and marine species.

Tolerance Assessment: There are no direct food or feed uses registered for coal tar/ creosote. Moreover, label restrictions prohibit the use of coal tar or creosote products registered for farm and home use to treat wood intended to be used in a manner in which the preservative may become a component of food or feed. Therefore the Agency has not established tolerances or exemptions from tolerance in raw agricultural commodities, processed food and feed, or animals under the Federal Food, Drug and Cosmetic Act (FFDCA). No clearances are required under the FFDCA to support the registered uses of coal tar/creosote.

Because there are no food or feed uses, certain subchronic and chronic studies, such as rat metabolism, chronic feeding studies in rats and dogs, and reproduction studies are not required.

4. SUMMARY OF REGULATORY POSITIONS AND RATIONALES

---The Agency is continuing requirements imposed under the Special Review of coal tar/creosote products. These include restricted use classification and protective clothing and equipment requirements intended to reduce exposure of applicators and treatment plant workers.

---The Agency is requiring an evaluation of the permeability of various protective clothing materials to determine which offer the greatest protection from coal tar/creosote products.

---The Agency is requiring that registrants develop and maintain composite test materials(CTM) representing each of the eight standard products defined by the American Wood Preserver's Association(AWPA). The physical/chemical specifications of each product should be submitted along with the procedure for developing the composite. The Agency requires that each composite be analyzed for the identity and quantity of individual constituents.

---The Agency is requiring toxicology testing using composite materials that are representative of typical AWPA standard products of coal tar/creosote. This is necessary because coal tar/creosote products consist of a large number of individual constituents, testing of all of which is impractical.

---The Agency is requiring ecological effects data on AWPA standard products of coal tar/creosote typically used for the treatment of wood for the freshwater and saltwater environments.

---All environmental fate data requirements for terrestial and aquatic nonfood uses (40 CFR 158.130) are required. Test materials for these studies will be determined by the Agency after it has received and reviewed the product chemistry and other required data for the eight composites of AWPA standard products.

---The Agency is requiring registrants to conduct a preliminary epidemiological study prior to requiring a comprehensive epidemiological study in order to develop baseline data on the nature and degree of risks to wood treatment plant workers.

---Exposure and work activity data are required to assess the quantity and nature of coal tar/creosote products to which treatment plant workers are exposed. Such studies will be useful in designing an appropriate epidemiological protocol or in quantitative risk assessment.

5. SUMMARY OF LABELING STATEMENTS

Labeling requirements for coal tar/creosote products are outlined in Part IV.D of the registration standard. These requirements parallel those presented in the Federal Register Notice, 51 FR 1334, dated January 10, 1986. Specific labeling language is outlined for for wood preservative products for each of the following five use categories:

1. Pole Framing, Piling applications and Railroad Tie Repair uses
2. Pressure Treatment uses
3. Groundline Treatment of Utility Poles
4. Home and Farm Use
5. Non-Pressure Treatment

With the exception of the Pole Framing, Piling Applications and Railroad Tie Repair use category, product labels are required to carry "Restricted Use Pesticide" classification and associated language. The following types of label statements are required to appear on the labels of all coal tar/creosote products.

--- Precautionary statements, including signal word DANGER based on potential eye effects

--- Statements of practical treatment, including a statement not to induce vomiting if swallowed

--- Protective clothing statements, including gloves, boots and coveralls impervious to coal tar/creosote products; requirements for the decontamination and cleaning of such clothing.

--- Requirements for cartridge or canister respirators for workers in treatment plants and for use around farms and homes where inhalation exposure cannot be avoided.

--- A prohibition against indoor application and prohibition against use of treated wood products indoors.

--- A prohibition against the use of home and farm products in such a way that residues might transfer to crops, food, feed or animals, such as crop storage buildings or beehives, or where animals may be directly exposed to the pesticide, such as brooding pens.

--- A prohibition against use where irrigation or drinking water contamination may result.

--- Environmental hazard statements concerning toxicity to fish.

--- Identification as a toxic hazardous waste if disposed of.

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6. SUMMARY OF MAJOR DATA GAPS

Product Chemistry
- --Product identity
- --Analysis and certification of product ingredients
- --Physical/chemical characteristics

Environmental Fate
- --Hydrolysis
- --Photodegradation in water
- --Aerobic soil metabolism
- --Anarobic aquatic metabolism
- --Aerobic aquatic metabolism
- --Leaching and adsorption/desorption
- --Soil dissipation
- --Aquatic dissipation

Toxicology studies
- --Acute toxicity
- --Subchronic dermal and inhalation
- --Oncogenicity (dermal)
- --Teratogenicity
- --Mutagenicity

Ecological effects studies
- --Avian acute toxicty
- --Acute freshwater fish/invertebrates and estuarine organisms

Special studies
- --Protective clothing permeability and durability studies
- --Exposure studies (Protocol)
- --Worker activities studies
- --Epidemiology feasibility study

7. CONTACT PERSON AT EPA

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